

## **REMARKS**

### **I. Status of the Application and Claims**

With entry of this Amendment, claims 35-58 are pending in the application.

New claims 35-58 substantially correspond to examined claims 13-34. The claims have been rewritten by Applicants solely to more clearly recite their invention and to address issued raised by the Office under section 112, second paragraph. The amendments do not enter new matter into the application.

The Office objects to the specification because it lacks headings. Office action, page 2. Applicants have amended the application to insert headings into the appropriate places in the specification. No new matter is entered by the amendments. Applicants request withdrawal of the objection.

### **II. Rejection Under 35 U.S.C. § 101**

The Office rejects claims 30-34 under 35 U.S.C. § 101 for reciting a use, which makes the claims improper process claims under section 101. Office action, page 4. Claims 30-34 have been canceled, rendering the rejection moot. New claims 57 and 58 are directed to "[a] constituent of implants," which is a composition, and thus patentable subject matter under section 101. Accordingly, Applicants request that the Office reconsider and withdraw the rejection.

### **III. Claims 13-34 Are Definite**

Claims 13-34 have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as their invention. Office action, page 4. The Office bases the rejection on numerous grounds, which appear on pages 5-9 of the Office action.

Applicants traverse the rejection, however, to advance the prosecution of this application they have canceled claims 13-29 and rewritten them as claims 35-58 to more clearly recite their invention.

The Office contend that claims 13 and 24 are indefinite "because it is not clear what the phrase "thiol functions" is intended to refer [to] since the phrase is not defined in the specification or in the claims." Office action, page 5. Applicants traverse. One of skill in the art, reading the specification, would understand that a "thiol function" refers to a monovalent group -SR wherein R is hydrogen or a hydrocarbon-based radical, See, *for example*, page 10, line 26 of the specification. Accordingly, Applicants submit that this phrase is not indefinite.

The Office urges that the recitation of "and/or" in claims 35, 36, 40, 50, and 52 renders the claims indefinite. Applicants submit the skilled artisan would understand that:

Claims 35 and 52: the collagenic peptide is soluble in aqueous media or in polar solvents, or in aqueous media and in polar solvents;

Claim 36:  $R^2$  is a radical which is aliphatic or alicyclic or aromatic, or which includes one or several aliphatic moieties and one or several alicyclic moieties and one or several aromatic moieties, as well as the other possible combinations of moieties;

Claim 40:  $R^2$  is sulfurated and aminated, or  $R^2$  is either sulfurated or aminated; and

Claim 50: the hydrocarbon species is either an alkyl group or an alkenyl groups or an alicyclic group or an aromatic, or is a group including one or several alkyl moieties

and one or several alicyclic moieties and one or several aromatic moieties, as well as the other possible combinations of moieties.

Rejection of claim 23 is based on the recitation "such that the molecular weight of the polymer chain is between 100 and 15 000" in part because it is allegedly not clear whether the molecular weight is in Daltons or KiloDaltons. Office action, page 7. The molecular weights are in Daltons, which Applicants have informed the undersigned that the skilled man would understand is the default when a value for a molecular weight does not indicate a unit.

Claim 26 was rejected for reciting "and possible carboxylic function are blocked." Applicants submit that the carboxylic functions (if they are present in the mercaptoamino residues) are blocked, that is, inactivated, in order not to interfere with the exclusive grafting of the mercaptoamino residues onto the aspartic acids and glutamic acids of the collagenic chain.

The Office also contends that claims 14, 16, and 18-20 are indefinite in reciting " $[-CR_2^0]_x$ " because it is not clear what this is intended to refer to. Applicants traverse. The "2" in the formula means that there are two  $R^0$  groups attached to the carbon, just as the 2 in  $-CH_2-$  indicates to one of skill in the art that there are two hydrogen atoms attached to the carbon. Applicants submit that the meaning of the claims would be readily understood by the skilled artisan.

In view of the amendments and remarks herein, Applicants request reconsideration and withdrawal of the rejection.

#### **IV. The Claims Are Patentable Over the Cited References**

The Office rejected claims 13-29 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,763,579 to Gagnieu *et al.* ("Gagnieu I") taken with U.S. Patent No. 5,412,076 to Gagnieu *et al.* ("Gagnieu II") and Lin *et al.*, Biochem. Biophys. Acta, 1038(3):382-85 ("Lin"). Applicants traverse the rejection.

Applicants traverse because the combination of Gagnieu I, Gagnieu II, and Lin does not teach or suggest all of the limitations of the rejected claims. Gagnieu I corresponds to FR-2,699,184, which is cited in the specification at page 5, line 16-32. According to the teaching of Gagnieu I, the functionalizing agent which is the precursor of the thiolated derivative grafted onto the collagen comprises: (1) an activated carboxyl function, which reacts with the NH<sub>2</sub> functions of the collagenic lysines to form amides and with the OH functions of the collagenic serines, threonines and OH-prolines to form esters; and (2) a protected amine function, which cannot react with the carboxyl moieties of the collagenic aspartic acids and glutamic acids. Thus, the crosslinking functionalities of the modified collagen disclosed in Gagnieu I are carried by amino acid moieties other than the aspartic acids and glutamic acids of the collagen chain. In contrast, in the claimed invention the collagenic peptide mercaptoamino residues are exclusively grafted onto the aspartic acid and glutamic acid residues of the collagenic chain via amide bonds.

Gagnieu II corresponds to FR-2,692,582, which is cited in the specification at page 4, line 26 to page 5, line 14. Although Gagnieu II states that "[o]ther 'cystic' residues fix directly to the amino acids carrying carboxyl groups (glutamic and aspartic acids)" (col. 5, lines 31-33), Gagnieu II does not teach or suggest that the

mercaptoamino grafts are exclusively bound to the aspartic acid and glutamic acid residues of the collagen.

Lin is cited as "clearly show[ing] that the sulfhydryl group incorporation scheme can be used to introduce sulfhydryl groups directly into proteins." Office action, page 12. Lin does not cure the deficiency of Gagnieu I and Gagnieu II mentioned above.

None of the three cited references, either alone or in combination, teaches selecting exclusively and specifically aspartic acid and glutamic acid residues of the collagen as grafting sites for the crosslinking functions provided by the mercaptoamino residue. Accordingly, the combination of Gagnieu I, Gagnieu II, and Lin does not teach or suggest all of the limitations of the rejected claims. For this reason Applicants request that the Office reconsider and withdraw the rejection.

### **CONCLUSION**


In view of the foregoing amendments and remarks, Applicants submit this application is in condition for allowance. Early notice to that effect is earnestly solicited.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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